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COMPUTERNEWS

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Subscriptions

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Cover Story

This month's cover is a promotional poster by Gandalf, manufacturers of the PACX-IV. At the end of May UTCS will continue it's project to enhance interactive services with PACX-IV. See page 3.

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PACX-IV: DIAL-IN SERVICE

PACX is a private automatic computer exchange that allows your terminal to select one of several computers. Several versions of PACX have been in use since 1972 at various universities and computer centres, proving their reliability and usefulness. UTCS' new model, PACX-IV, has several improvements over earlier models, notably in the dialogue with the user. PACX-IV can connect 512 terminals or modems and 256 computer ports. It can support 256 simultaneous active sessions, each with a data rate as high as 9600 BAUD.

At the end of May, UTCS will merge the dial-in lines for our interactive services with a larger number of lines and will connect them to the PACX-IV. At that time users will access any service - DEC-10, ATMS, APL, TSO, WYLBUR - from the same phone number. This move provides several advantages and benefits. For example, PACX-IV will provide users with more flexible access to our interactive services and will allow us to introduce new machines and services more quickly while simultaneously increasing the utilization and cost effectiveness of dial-in modems and computer ports. The exact date of implementation will be announced through signon messages and HOTNEWS.

Current CAN holders and users will be mailed an instruction sheet describing the new PACX connecting procedures. This article explains (1) how PACX affects dial-in users, (2) how to connect through PACX and (3) some of the problems users may initially experience with PACX.

Local users will have inexpensive access to higher data rates over a leased line to PACX. If you are close to the campus, a leased line will cost less per month than your terminal phone. Your CSR has more details. Dial-in users will also benefit. They will need to remember fewer phone numbers and they will have access to a larger pool of computer ports. For example, DEC-10 dial-in users currently have a pool of 30 ports and dedicated users have a pool of 10 low speed ports. After the dial-in modems are connected to PACX, a pool of 40 low speed DEC-10 ports will be available on a first-come, first-served basis. In addition, after the PACX connection, users with 212A modems (1200 BAUD) will have access to the DEC-10. Currently, 212A users can access only the IBM.

Connecting through PACX

Only users dialing into our interactive services for the DEC-10, IBM 3033 and PDP 11/70 will notice two major differences by coming through PACX.

- They can connect to any of the machines (IBM 3033, DEC-10, etc.) from their dialed line.
- They must enter into a simple, PACX-prompted dialogue to select their service.

Currently, PACX does not support 2741 or APL terminals. (See "APL Terminals" at the end of this article.) These terminal users must dial 978-4960 for IBM services. These terminals will be supported in the future and notice will be given on their switch to PACX. The phone numbers to remember *with* PACX are:

• low speed (300 BAUD or less), centrex	978-6200
• low speed, non-centrex	978-6201
• 212A modems (1200 BAUD)	978-3959

The centrex number, 6200, should be dialed by users whose phones are connected to the U of T telephone exchange. (The number of your terminal phone will begin with 978-.) Those outside the St. George campus should dial 978-6201.

After dialing and receiving the modem

continued...

PACX IV continued

tone, you can successfully talk to PACX by remembering two things.

1. Begin by pressing RETURN <RET>. (This identifies your terminal speed and character set. PACX will then prompt for your service class digits.)
2. Enter the service class digits. Currently these are:

10 - DEC-10 300 BAUD or less
11 - DEC-10 1200 BAUD (212A modems)
30 or 31 - IBM 3033
70 - PDP-11/70 300 BAUD
71 - PDP-11/70 1200 BAUD (212A modems)

The following sequence of actions demonstrates how you would select the IBM 3033.

- Dial the number and wait for the tone.
- When your modem is ready, enter into the PACX dialogue:

YOU: <RET>

PACX: ENTER CLASS:

YOU: 30 <RET> Enter this response immediately after the colon ':'. Note that PACX will echo the service class digits back to your terminal.

PACX: CLASS 30 START

At this point, PACX becomes invisible and you are connected to a port on the IBM front end. A <RET> or two will get you the familiar IBM response. Continue your session by selecting your IBM service and logging on.

Connecting to the DEC-10 is completely analogous. When PACX prompts you for the service class digits, enter 10 if your terminal speed is 300 BAUD or less or enter 11 if your speed is 1200 BAUD and you're using a 212A modem. More detailed information is available on the DEC-10 PACX help file.

In most cases you will connect successfully to your service on the first try. If not, PACX has variants of its dialogue to give you an indication of what happened. As well, it offers 2 additional tries to connect to your service. The following messages may appear:

BYE: Re-dial and try again. You have either delayed your response for more than 20 seconds or you have used up your 3 chances to connect.

INVALID RESPONSE: The digits entered are invalid.

CLASS xx UNAVAILABLE: Class xx computer ports are down.

CLASS xx UNASSIGNED: Class xx does not exist.

CLASS xx RESTRICTED: Your terminal does not have access to class xx.

CLASS xx BUSY

QUEUE POSITION nn DO YOU WISH TO QUEUE?: All ports to class xx are busy and your queue position is nn. Enter:

Y - to queue. A message will inform you every 5 minutes of your queue position and a BELL will inform you when you are connected.

N - to select another class.

Current Communication Problems

Some of the communications problems are described below.

1. **'Dead' Ports**

   These are encountered after PACX has connected you to a computer port and you receive no response at your terminal. These occur for various reasons: port speed does not correspond with your terminal speed, the connect-

continued...

PACX IV continued

ed port has its hardware or software in a ‘hung’ state or hardware failure has occurred. Some of these occurrences are temporary or you may have selected the wrong class. Try connecting again. If the problem persists, call operations (IBM: 978-7393, DEC-10: 978-4318) and describe your problem. They should be able to provide you with a computer port.

2. **APL Terminals**

   APL terminals, during the PACX dialogue, will present prompts in gibberish (APL characters). Enter your service class digits anyway. This problem will be fixed in a future PACX software release.

Future PACX Enhancements

PACX services will be enhanced both in the number of services available and in the User-PACX interface. These will be announced in *COMPUTERNEWS* and on login messages.

Dr. Walter Rosocha

IMPROVEMENTS TO INSTRUCTIONAL SERVICES

In February 1981, a task subcommittee of the Presidential Advisory Committee on Computing Facilities and Services (PACCFS) recommended that several improvements be made to UTCS’ instructional services. The working subcommittee, comprised of professors, students and a member from UTCS, identified three main areas requiring improvement.

As for the High Speed Job Stream (HSJS), which comprises most of the instructional workload, both (1) shortage of access points and (2) an antiquated method of accessing facilities (keypunches and card readers) are factors in need of immediate improvement. (3) There is a lack of sufficient access to UNIX services for third and fourth year students. (An increase to 32 from the present 10 terminals was recommended as a solution.)

The task force recommended that improvement to HSJS access be done in phases. The first phase of the plan calls for the installation of 60 terminals to provide student job preparation facilities. Students will edit their program with interactive video display terminals, submit them to the IBM 3033 for execution and receive output on a high speed line printer. Until this phase is operational and proven, no changes will be made to our existing keypunch terminal areas.

Phase two of the plan involves both additional terminals and an extension to the system to permit output retrieval at the video workstations. Line printer facilities would be available for optional use and final copy.

The third and final phase would permit full interactive use of the computing facilities and the complete replacement of all punch card equipment.

Work is already in progress to complete phase one of the committee’s recommendations. A skeletal configuration of a Digital Equipment VAX/780 has been acquired to provide development facilities for implementation of the PACCFS report. With the acquisition and installation of additional memory, storage and terminals, such a configuration may constitute the first student interactive job preparation environment. A UTCS implementation task force has been formed and a committee of professors, students and UTCS staff has been established to monitor and steer the various activities involved. These activities include site planning and preparation (this will be the largest student access area); appropriate

continued...

IMPROVEMENTS continued

hardware selection and installation; software development; student field testing; preparation and production of manuals and student aids; and lastly the definition and implementation of a mini-course to introduce students to the new system.

Although this project will require an enormous effort to be successfully completed on time, the result will be a dramatic improvement in the delivery of computing services at the University of Toronto. *COMPUTERNEWS* will publish more articles on the progress of this project.

Terry Wood

MINPACK AVAILABLE AT UTCS

Documentation can be obtained through the Information Office. The routines are in the library APPL.MATH.MINPKLIB.

MINPACK-1 is a package of FORTRAN programs for the numerical solution of systems of nonlinear equations and nonlinear least squares problems. The programs are designed to be reliable, easy-to-use and transportable. Future editions of the MINPACK package will address unconstrained minimization and constrained optimization problems.

For each problem area MINPACK-1 contains algorithms that proceed either from analytic specification of the Jacobian matrix of the problem functions or directly from the problem functions themselves. Since the specification of the Jacobian matrix can be an error prone task, MINPACK-1 also contains an algorithm to check that the Jacobian matrix is consistent with the functions. Also included in the package are machine-readable documentation and a complete set of testing aids.

There are five general algorithmic paths in MINPACK-1. Each path includes a core subroutine and an 'easy-to-use' driver with a simplified calling sequence made possible by assuming default settings for certain parameters and by returning a limited amount of information; many applictions do not require full flexibility and, in these cases, 'easy-to-use' drivers can be invoked.

The algorithmic paths include facilities for systems of nonlinear equations with a banded Jacobian matrix and for nonlinear least squares problems with a large amount of data. Options in the core subroutines enable, for example, scaling of the variables and printing of intermediate results at specified iterations.

The package contains both single and double precision versions of the routines in MINPACK-1. For each precision there is a function that provides machine-dependent constants (when an appropriate set of DATA statements is activated); all other MINPACK-1 subprograms are written in a portable subset of ANSI standard FORTRAN. For those subprograms normally called by the user, machine-readable documentation is provided for both the single and the double precision forms.

MINPACK-1 was produced at Argonne National Laboratory under the Applied Mathematical Sciences Program of the Department of Energy and with the assistance of about 16 test sites using the following computing systems: IBM 360/370, CDC 6000/7000, Univac 1100, Cray-1, Burroughs 6700, DEC PDP-10, Honeywell 6000, Prime 400, Itel AS/6 and ICL 2980.

Rob Janes

SUPPLIES SALES POLICY TO BE ENFORCED

It has been UTCS' policy, as dictated by budget restrictions, that incremental expenses incurred on behalf of a user could not be charged to that user's Customer Account Number (CAN) funds. These expenses must be covered by real-monied funds, debit memo (University users) or invoice (external users). University users making payment by debit memo must use an appropriation number other than 1-xxx-xxx-90, 95 or 98. Occasionally this policy has not been enforced. However because of increased, unbudgeted expenses for the provision of services such as tape/paper sales, typeset output and text entry, it *will* henceforth be enforced. UTCS regrets any inconvenience that users may experience.

Tapes

Users may purchase magnetic tapes from the Tape Librarian, Room 368A, McLennan Labs.

The following are prices of tapes which will include the application of reflective markers and tape labelling if required.

2400 foot reel, including tape seal	$25.
600 foot mini-reel in plastic container	$15.

Publications

Effective May 1, 1981, all chargeable publications obtained from UTCS must be paid for either from a non-computing appropriation account or in cash.

Items such as reference cards, HOW TOs and USERBOOK sections for courses will continue to be available free of charge.

If you are in doubt as to the category in which your documentation needs fall, please phone the Information Office at 978-4990.

Bill Lauriston

Marg Doherty

CLASS C SUMMER SPECIALS

This summer, CLASS C users will be able to take advantage of our special summer CLASS C service. During the period of June through September, CLASS C memory will be charged for at **half of the usual rate** and the hours of service for CLASS C will be significantly expanded.

For full details regarding the summer service changes for CLASS C, contact your CSR.

Ralph Lombardi

CHILD IN THE CITY REPORT NO. 8

Editor's Note: The following excerpt is from Report No. 8 by Frederick Hill and was generated by the The Child in the City Programme and The Centre for Urban and Community Studies, University of Toronto. The author and his assistants are satisfied users of the UTCS DEC-10.

Introduction

Zoltan,[1] the 14-year old son of Hungarian Roman Catholic parents, lives in a fairly high-income suburban neighbourhood in Toronto. Both of his parents, his grandmother and his older sister live with him, and he usually speaks Magyar at home with his parents. His father's manufacturing business enables the family to live in a large single-family home, without his mother having to work.

Zoltan leads an active life. He is on the school football team and goes swimming and roller-skating once or twice a week. He enjoys his weekly puppetry lessons very much, plays several instruments, and his hobbies are photography, model-building, and chemistry. He goes to the public library once or twice a month, gets good grades, does homework for an hour or so most nights, likes school and expects to go to university. His typical monthly schedule includes a movie or two, a dance at his junior high school - though he hates discos and never goes to them - some shopping at the nearby plaza, and church attendance. Last summer, so he readily claims, he engaged in sexual activity of some sort. He goes to restaurants, visits parks, and goes fishing, all about once or twice a month in eastern Ontario with his family. In spite of this busy schedule he manages to watch an average of two or three hours of television a day, usually alone, spend some time at friends' and relatives' homes, and still hang around the street almost every day, although he likes this less than most activities. He also hangs around the shopping mall once or twice a week, but he never plays pool. He attends many plays both at school and professional theatres.

Zoltan dislikes riding on the T.T.C. (the Toronto Transit Commission) very much, and he either walks or bicycles most places where he goes in Toronto, although there are four cars in his family. He firmly feels that there is a lot to do in his neighbourhood and relies mainly on these local opportunities. Most of his friends live there, and he strongly feels that he can easily get from where he lives to most places where he wants to go. He considers his neighbourhood an excellent place to live. He especially likes it's "calm mood" and, in fact, what he dislikes most about his neighbourhood is that sometimes "a pack of motorcycles or cars whip around and have races." Nothing comes to mind when asked if there is anything missing or anything which he would like to see added in his neighbourhood.

Compare Zoltan's life with George's. George is a printer's son, aged 13, living in a townhouse on a busy suburban street. He lives with both of his Canadian-born parents and his two younger sisters. His mother works part-time and he has a paper route.

George also enjoys sports very much, especially hockey, and takes the T.T.C. to a Blue Jays game once or twice a month with his friends. He also goes to a lot of big-name rock concerts. He is much less academically inclined than Zoltan. He is failing at school, never reads for pleasure or goes to the library, and dislikes school very much though he expects to get some sort of post-secondary, non-university training. George never goes to dances or discos, and never hangs around the street or in playgrounds although he and his friends hang around a hamburger place not far from home. He and his friends also travel by T.T.C. to play pinball downtown once or twice a month.

continued...

CHILD IN THE CITY continued

George dislikes the T.T.C., though not as much as Zoltan, and he uses it more. He either walks or goes by T.T.C. wherever he goes. Though his family has a car, he rarely goes anywhere with them or travels by car. He even attends the nearby Catholic church once or twice a month with his friends rather than his family. He is ambivalent about whether it is easy for him to get where he wants to go and about whether there is a lot for him to do in his neighbourhood. He also feels that there are too many people from other countries in his neighbourhood and strongly disagrees with the idea that people who come to Canada from different countries should be encouraged to keep their old ways. He has never eaten in an ethnic restaurant.

George watches enormous amounts of television - more than 35 hours a week in his estimation - usually with his friends. He does not go to any clubs, recreation programs or youth groups or take lessons of any kind, and never goes to live stage productions, museums, exhibits, or art galleries. His favorite activities are movies, pinball, sports (both as spectator and participant), rock concerts and television.

These two profiles of teenagers' lives raise many interesting questions about the factors which account for differences in how, where, and with whom urban teenagers spend their time. Would Zoltan's life be much different if he lived in a high-rise or downtown, if he were Italian rather than Hungarian, if his parents were divorced, if he had six brothers and sisters instead of one sister only, or if he had better access to a public library? What is the relative importance of ethnicity, social class, family composition, and neighbourhood characterisitics, including access to opportunities of various types, in explaining the behaviour or activity pattern of children and teenagers? How are these activity patterns in turn related to such youth-oriented problems as delinquency, vandalism, underachievement in school, illness, drug abuse, etc? And if we knew the answers to such questions, how could we plan cities so that the needs of children and teenagers would be better served than at present?

Child in the City Report No. 8 presents a few basic findings from a study undertaken to document some of the dimensions along which teenagers' lives and activities differ and to relate these differences to a number of other aspects of change in the social and physical fabric of cities. The primary interest was in how access to opportunities affects teenagers' lives, since decisions about the provision of specific relevant opportunities in specific locations are constantly being made with minimal knowledge about the effect which the level and distribution of these resources will have on teenagers' lives and well-being. The provision of opportunities is more amenable to manipulation for socially desirable ends than several other factors (family composition, ethnicity and social class, for example) which, though perhaps more important influences on behaviour and well-being than access to opportunities, are largely beyond the sphere of government influence or at least would not be manipulated with the intention of affecting teenagers' lives. But in order to assess the effect which access has on behaviour, the effects of other factors must also be eliminated or controlled statistically, the effect of access put into proper perspective, and the possibility of so-called interaction effects examined.

Sorting out the effect of these various factors is a long and difficult task and *Child in the City Report No. 8* only serves as an introduction to a series of reports which will attempt to do so. It presents some basic data arising out of a questionnaire completed by some 7,000 grade 9 students in most public and Separate high schools in Metropolitan Toronto, mainly in April and May of 1979. At the same time, senior urban geography students were completing a curriculum unit designed to obtain information about the distribution of most types of opportunities relevant to children and teenagers - facilities, services, activities, programmes, land uses, spaces, etc. A review of the literature on the relationships between children and the urban physical

continued...

CHILD IN THE CITY continued

environment had led to the conclusion that "what strongly needs documentation is some picture of where children now live, related to what opportunities (of the various kinds) are realistically available to them - and by what means of access."[2] The method of using high school students to collect such data had its share of problems and that aspect of the whole research procedure will be described elsewhere. This paper focuses instead on the profile of grade 9 students' lives which our questionnaire has revealed, with no attempt to sort out the effects of the various factors influencing their behaviour. The paper describes not only how grade 9 students spend their time but also their means of travel for various activities, how much they like each activity, their opinions about their neighbourhood, their knowledge of the city, their school performance and aspirations, as well as family background information (parents' education and occupations, ethnicity, family composition and size).

The results presented here are based upon a subsample of 900 questionnaires drawn from the larger sample of 7,000 usable questionnaires. From each participating school, enough questionnaires to represent 3 per cent of the grade 9 student enrollment were randomly selected for inclusion in the subsample. Their subsample is large enough for descriptive purposes. The full sample will be used in subsequent analyses whenever larger numbers are required. Details of the sampling methodology and the demographic characteristics of the sample are provided.

Child in the City Report No. 8 has no pretensions of being analytical. The intention rather is simply to provide an overview of the lives and opinions of grade 9 students as revealed by the questionnaire. Most results are presented separately for girls and boys, but further breakdown by family and neighbourhood characteristics and by subarea requires the use of the full sample. Subsequent papers will be more analytical. Because interpretation of the results would be largely speculative at this stage, interpretation has been for the most part avoided.

Frederick Hill

Copies of the survey instrument are available from the author. Requests should be sent to Child In The City Programme, University of Toronto, 455 Spadina Avenue, #424, Toronto, Ontario, M5S 2G8.

[1] Neither of the names used in this paper is believed to be the real name of the person described, but the profiles presented are based upon actual questionnaires completed by students in the survey described in this paper.

[2] William Michelson and Ellis Roberts, "Children and The Urban Physical Environment," in William Michelson *et al.*, *The Child in the City: Changes and Challenges* (Toronto: University of Toronto Press, 1979), p. 459.

PAPER DRILL FACILITY

To augment facilities available for the handling of output, UTCS has installed a paper drill, located in Room 367 of the McLennan Labs. It is one of the devices available to post-process printed output from one of the UTCS printers.

The charge of $5. per quarter hour will be levied against a user's CAN. Arrangements can be made for different sizes and locations of holes to be drilled through stacks of decollated and burst computer output.

Please note that the facility is available at no other UTCS location. Adequate details of the location and size of hole must be given to operational staff at the service window.

ATMS UPDATE

A 'maintenance' release of ATMS was installed on April 13, 1981. This new installation fixed a number of known problems associated with the previous system and was principally installed to improve the handling of user accounts. For this purpose a new command 'options' has been provided so that a user can control a variety of fields pertaining both to his account and to the information printed along with documents from the high speed printers. Full details may be found using the 'help' facility.

In particular, new users of ATMS will perceive a difference - the system will now prompt for many of the variables which were previously specified manually (and sometimes misunderstood) when a new account was opened.

New users are asked for responses and opinions on the possibility of implementing a 'who' command. Such a command, intended to identify a relationship between ATMS operator numbers and names of individual users, would be helpful when using ATMS as an electronic mail system.

We welcome the user community's reaction before implementing such a facility.

Dr. Frank Spitzer

NEW UNIX COURSE

To help the significant numbers of users of the UNIX system who are turning to UTCS for assistance in text processing applications, a new course will soon be offered. This course, to discuss the use of UNIX for text editing and entry as well as for formatting using NROFF/TROFF, will be offered in late June.

Candidates for this course will probably be people intending to use the UNIX system who have had no previous experience in that environment. UNIX' particular strengths lie in the areas of technical typesetting and table and equation presentation. Those interested should call the Information Office at 978-4990.

John Bradley

UTCS CHANGE COMMITTEE

UTCS management must deal with a regular stream of requests for changes in service. Such requests concern all facets of UTCS' operation -- equipment, programs, remote terminals, accounting and so on. The changes dealt with can have varying degrees of impact on users. Some of them have considerable impact, as in the case of ACF2, or minimal impact, as in the recent request to "formalize HOTNEWS and BROADCAST responsibilities."

The Change Committee was struck in 1979 out of a need to provide a regular forum for discussion and approval of these requests. It is composed of all of the managers of

continued...

CHANGE COMMITTEE continued

UTCS and the associate director, Rein Mikkor.

Users usually submit requests for changes to their CSR. Change requests are subsequently submitted at the meetings by either the CSR or by the appropriate manager. Major changes are often submitted and dealt with through UTCS' Faculty Liaison Officer, Dr. Frank Spitzer. UTCS employees also submit change requests as they see fit.

Meetings take place every Thursday morning. They are chaired by Ward Beattie, Systems Manager. Progress on all outstanding requests is first reviewed and status changes recorded. Any new change requests are then presented. A great number of the requests are simply routine and are approved without incident. However, the viability of many of the requests can only be assessed after considerable discussion. Changes in service can often have effects far beyond those intended by the originator.

As secretary of the Change Committee, I have been asked by *COMPUTERNEWS* staff to report regularly on its work -- to make the more interesting change proposals known beyond the internal distribution of the minutes and to report on progress of such changes should they be approved. I have agreed to do so, as long as this idea is approved by the Change Committee ...

Terry Farley

NEW SCHEDULE FOR COMPUTERNEWS

COMPUTERNEWS will be published as a double issue during the following months ...

March/April
May/June
July/August
November/December...

thus effecting an 8-issue/year schedule.

We are restricting the number of issues of *COMPUTERNEWS* in order to free some of our limited documentation resources. The revised publication schedule will allow us to dedicate more resources to other documentation areas such as online and user reference material. The new schedule is based on the academic year and is designed to ensure that *COMPUTERNEWS* will be produced monthly during our peak business period.

Comments and suggestions regarding the newsletter and other UTCS publications are invited and should be directed to any member of the publications staff (Engineering Annex Bldg., room 201) or by calling 978-2066.

The Editor

DEC-10 TAPE LIBRARY MERGE

On May 1 the DEC-10 tape library was merged with the 'N' and 'F' tape libraries. This move involved assigning new tape numbers to all tapes in the DEC-10 tape library. CAN holders have been informed by mail that this merger took place and have been given their new tape numbers. An online file of old and new tape numbers is in the file DOC:TAPES which can be browsed to find new tape numbers from old numbers.

As of May 1 there is a charge levied against CANs for each tape that was in the DEC-10 library that the CAN controls. The charge is $1.60 per tape per month. For UTCS-

continued...

DEC-10 TAPE LIBRARY continued

owned tapes ('N' tapes), this is a rental charge. For user-owned tapes ('F' tapes), this is a storage charge. The merging of the libraries results from the move of the DEC-10 into the same area as the IBM machines and their libraries.

There are some new security measures involving DEC-10 tapes. By default no DEC-10 'N' or 'F' tape will be mountable on the Academic IBM machine. Each tape can be marked as being IBM-mountable, if the person controlling the tape so wishes. In addition tapes can be marked 'read-only' by putting a red seal on the tape. All DEC-10 tapes will be mountable on the DEC-10 only by the PPNs listed on the tape itself. (This is the same system as before.) No non-DEC-10 tape will be mountable on the DEC-10 since it will not have a list of attached PPNs. If you have an 'N' or 'F' tape to be mounted on the DEC-10 - and that tape has always been an 'IBM' tape - contact the tape librarian to have a list of PPNs attached to the tape.

The operations personnel and the tape librarians are certain that this new merged tape library will operate more smoothly and efficiently. Any user with questions about the merger or with requests to make tape changes should contact the tape librarians at 978-7319 or 978-6693.

Corot Reason

VICTORIA DAY WEEKEND HOURS OF SERVICE

The following hours of service are in effect during the Victoria Day weekend.

	MAY 16 (Saturday)	**MAY 17 (Sunday)**	**MAY 18 (Monday)**
Academic Services (GPJS, HSJS, TSO, WYLBUR)	08:00-20:00	08:00-20:00	Closed
APL/ATMS	08:00-20:00*	08:00-20:00*	Unattended
DEC 1090	08:00-20:00*	08:00-20:00*	Unattended

* Running unattended outside these hours

Normal hours of service for all systems will resume Tuesday, May 19, 1981.

THE MENACE OF MICROS

Editor's Note: This article is reprinted from the November 3/80 issue of Computerworld, with special permission from the author.

One of human beings' more popular pastimes has always been the prediction of the end of the world. Some predictions, such as the Armageddon of the Revelation of St. John, are the result of inspiration, divine or otherwise. Others, such as the original Malthusian prediction or, more recently, those of the Club of Rome, have arisen from the development of input/output models of greater or lesser accuracy. A third category, one of the favorites of the disaster school of science fiction writers, springs from the uses and abuses of technology. We are concerned here with one of these.

There are several standard avenues down which we can follow technology to our destruction. The first proceeds from the laboratory of the mad, misunderstood or frustrated scientist. This road, exemplified by Dr. Frankenstein's creation, has often not been followed to the end (that is, the good guys often win), although the potential is always there.

The second major avenue is that of technology out of control. It has three major branches: the accidental catastrophe, the unforeseen consequence and the deliberate seizure of control by the technological creation. The computer that raped Julie Christie in order to produce progeny in the movie *Demon Seed* is a modern example of

continued...

THE MENACE OF MICROS continued

the last of these.

A well-traveled byway, which is often related to one of the above, is the mutual annihilation drama: for it is often started by a mad scientist or soldier (Dr. Strangelove) or an accident or act of God (the string of coincidental failures that started it all off in *Fail Safe).*

The last major theme of technological destruction is that of overdependence of technology, to the extent that man loses some essential skill, mental toughness or the physical strength to survive unaided (the big-headed intelligentsia encountered in the *The Time Machine,* for instance).

In What Sense 'Demise'?

Before I examine the particular track down which the microcomputer will carry us, however, I would like to explain what I mean by the phrase "the demise of Western civilization." And I will begin **that** by explaining what I **don't** mean.

In a trivial sense, every major technological advance has destroyed the civilization that existed at the time of its introduction into everyday life: the steam engine pushed us out of the fields and into cities, the automobile out of the cities and into the suburbs. The movies gathered us in huge crowds in darkened halls, television returned us to our own - darkened - living rooms. The compass and chronometer made intercontinental travel possible, the airplane makes it trivial and the present advances in communication technology can be expected to make it unnecessary.

This is **NOT** the demise I mean.

The tapestry which is Western civilization is the result of a continuous - but perhaps not always monotonic - developmental process that has been going on for thousands of years through all the vicissitudes such a span of time implies. Not all of its threads have been continuous or constant. The relative roles of "science" and "religion," for instance, have been at time united, at times in conflict; when in conflict, each has had its times of supremacy.

Some threads **have** been continuous, however. It is my belief that some of those persistent threads have been essential, that without them Western civilization - the civilization that developed the microcomputer - could not have come into being.

It is also my belief that one of the consequences of the development of the microcomputer will be the severance of one of the most crucial of these threads. Furthermore, I believe that the ensuing disruption will cause the whole fabric to tear in an irreparable fashion. That the result will be the end of the human race or even the end of civilization I much doubt, although the possibility should not be dismissed out of hand; that it will be the end of Western civilization I have no doubt whatsoever.

How It Won't Happen

There is common speculation about at least four possible dismal futures the microcomputer can help to bring about: total unemployment, the revolt of the robots, the misapplication of genetic engineering and the ultimate Terminal Man. I will begin by dismissing them.

Total Unemployment. This particular specter has been raised with the introduction of each new labor-saving device since time began (the log-rollers probably protested the invention of the wheel), and each time, in fact, quite the reverse has prevailed. The spinning jenny may have done the work of 1,000 women but hundreds of thousands were eventually needed in the mills. The automobile may have put the horse out of business, but Henry Ford saw to it that many more mechanics are needed than blacksmiths, many more oil industry personnel than haymakers. The computer itself was hailed (or cursed) as the end of any of a number of occupations; the computing industries now support many more people than the computer has displaced.

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THE MENACE OF MICROS continued

In the actual event, it is the nature of the work that changes, not the size of the work force. While it is true that each new tool has displaced some workers from traditional tasks, it is also true that each new tool has encouraged humans to attempt ever more difficult challenges and these new challenges have led to totally new occupations.

There still remains an ample supply of problems that are beyond our capacity: real-time weather prediction, positive weather control, the domestication of the earthquake and the volcano, colonization of the moon, regeneration of lost or broken limbs or organs - the list is endless. One assumes that the microcomputer will contribute in some measure to the solution of some of these problems or their preliminaries and in so doing will generate whole industries even the science fiction folk have not yet dreamed of.

Furthermore, the microcomputer will help combat unemployment in another, more important way by providing opportunities for the previously unemployable. A few of the contributions in this area are:

- Artificial voices for those who cannot speak.
- Workstations for the sightless.
- Simpler and finer controls for prosthetic limbs.
- Communication for those paralyzed by stroke.
- Augmentation of brain power for the mentally handicapped (thus reversing the traditional division of labor between human and machine).

Again, I am sure this list is incomplete and the next decade will see advances beyond my wildest speculations.

As an aside, I might note that there are two opposing schools of thought on the unemployment issue. One is implicit in the term "universal unemployment"; the other might prefer to use "opportunity for expanded leisure." Whether you find the absence of labor to be a Utopian situation and devoutly to be wished, or whether you believe that it is only the Devil who makes work for idle hands, I believe you are worrying about the wrong problem. The microcomputer will not put the human race out of work.

The Revolt of the Robots. There are those who think such a thing could not happen because of the Asimovian Laws of Robotics. There are also those who think the robots may never hear of Dr. Asimov. This section is addressed to the latter group.

It seems to me that the principal prerequisite for a true Revolt of the Robots is the simulation of the human brain in very nearly equivalent volume and without cryogenics. (I can think of no creation more dependent upon the maintenance of a high technology than a cryogenic brain. The miniaturization necessary to get both the brain and its cooling factory into some sort of reasonable volume is awesome to contemplate.)

However, let us for the sake of argument assume the occurrence of a Revolt of the Robots. I claim that in the absence of the annihilation of the human race, such a revolt will not end Western civilization, *regardless of which side is victorious.* Obviously, if humans win, they will repress - and possibly lobotomize - the robots. (This will lead to the creation of the Society for the Prevention of Cruelty to Robots [SPCR], which will work diligently to improve the conditions of robot life.)

It is not in people's nature to turn their backs on a convenience simply because it is recalcitrant. Humans will therefore NOT extirpate the robots, but may overspecialize them and try to deny them any interrobot

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THE MENACE OF MICROS continued

communication in an attempt to keep them under control. Either we will succeed or we shall have had a successful Revolt of the Robots.

In this case we shall have a situation in which robot is master, human is slave. This event will undoubtedly slow the progress of Western civilization, but it is unlikely to result in its end. There are two major reasons for this. First, because the robots are unlikely to do other than simply reverse the original roles of robot and human and maintain the existing civilization. But more important, because slavery has been an important concomitant of much of Western civilization from its very beginnings in ancient Greece. The human race knows how to deal with slavery and how to survive serfdom. Humans have been subjected to many forms of mental and physical enslavement including domination by conquest, by fear (of this world or the next), by economic chicanery (indenturing the the company store), by patronization, by mass hysteria and by drugs. The species has always survived.

And while history shows that we don't study it carefully enough to avoid the pitfalls of the past, it also shows that we continually climb out of the pits and are occasionally somewhat the better for the experience.

A successful Revolt of the Robots would simply be yet another pit, which would not contain us for long. It would also not materially change the outward attributes of Western civilization, but merely provide, temporarily, a new set of beneficiaries.

A final opinion: Unless and until the robots develop a sense of humor and the ability to act irrationally, they will never understand humans well enough to dominate them. In any case, whether or not the microcomputer brings about the Revolt of the Robots, the Revolt of the Robots will *not* bring about the demise of Western civilization.

The improper Application of Genetic Engineering. This whole area is such an emotional one that it is probably best if I begin by stating a prejudice and presumption.

1. I am opposed to genetic engineering on a number of moral and philosophical grounds, none of which is germane to this discussion. The opposition itself may be germane, however, for it may distort my view of this portion of the future.
2. I believe it is going to happen, soon, and that the microcomputer will play a major role.

Experiments in genetic engineering will go forth, with or without the blessing of the legal, social, religious or professional establishment. The essence of human history is the posing of ever more difficult tasks and questions which, when once posed, nag at humanity until they are accomplished or resolved.

Genetic engineering is but the logical extension of earlier work in the biological sciences. Whether or not we approve of genetic engineering, we are standing on its threshold, and humankind is not known for pausing at such thresholds for reflection. The threshold, then, will be crossed and the microcomputer will play a part. What then?

Almost certainly there will be some great disasters and perhaps a giant stride forward or two. (I find it impossible at this juncture to imagine which direction might be construed as "forward.") But neither the triumphs nor the disasters will rend the very fabric of Western civilization. Pretty much by its very nature the changes wrought by genetic engineering must be slow ones, and Western civilization has shown itself to be quite adept at accommodating itself to slow change.

The effect of genetic engineering on Western civilization will be less profound and more gradual than the effect of television.

The Ultimate Terminal Man. The Ultimate Terminal Man, as a result of the im-

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THE MENACE OF MICROS continued

plantation of microcomputer-controlled sensors, receivers, servos and other mechanisms, will be capable of more than human operation but possess less than human volition. This will not be a new phenomenon, but merely a substitution of microelectronics for the psychological, hypnotic and chemical means that have been used for such ends for centuries. The Ulitmate Terminal Man is thus seen to be a form of robot constructed from rather perishable material and with rather high maintenance costs; the discussion of the Revolt of the Robots, therefore, pertains to this case also, leading to the same conclusion.

In summary, while it is indisputable that the microcomputer can accentuate these four threats, they are not really new ones, and Western civilization can be expected to survive them. One should always remember that the Good Guys will have micros, too!

The Real Reason

The real reason none of the situations described above will come to pass is that Western civilization will be dead, a victim of the microcomputer, long before any of these other influences will have a chance at it. Some of these events, indeed, may happened as *consequences* of the demise of Western civilization, rather than as causes.

What, then, is it about the microcomputer that will bring about the end of Western civilization? Which essential thread will it break? How can we best characterize this phenomenon?

These questions are most conveniently answered in the reverse order. The phenomenon can be characterized in a single word: isolation. The essential thread is face-to-face communication. Western civilization cannot survive without it.

A person, in order to retain his humanity, must remain in face to face communication with other poeple. All masks and intermediaries distort the message and dehumanize the person.

The automobile provides an admirable example of this effect. People who are polite and courteous in person, and who remain so to their passengers, frequently become aggressive and impatient as drivers. The walls of the automobile serve to divide the universe into two portions: the smaller one - within - where friends may be found, and the great outside which is peopled by enemies, antagonists, fools and incompetents.

Recent technology as a whole, in fact, appears to possess a definite bias toward increasing the isolation of individuals.

Television is more isolating than either radio or the movies. Radio drama, by forcing the listener to apply his own resources to flesh out, in his mind's eye, the bare sounds, somehow managed to create an identity and feeling of kinship which has escaped television. Television, by contrast, feeds the viewer so much information that use of his own imagination is strongly impeded, if not entirely prevented. And while the movies flood the viewer with as much information as television, at least they involve him in the pseudo-social exercise of leaving his den and mingling with other people, with some of whom he may have actual face-to-face conversation.

'Walking' Earphone

A more recent phenomenon is the "walking" earphone. Conrad Aiken wrote a very poignant short story of a child falling into the isolation of schizophrenia as his "Silent Snow, Secret Snow" cut him off from the rest of the world. Walking earphones are little less than a voluntary dive into a far from silent, but quite secret, snowbank.

Before looking specifically at the microcomputer, let us consider the role of computers and computerniks in general in the increasing isolation of humans. The first point to note is that people who work with computers generally prefer computers to people. Their failures at communicating with real people in the design and construction of their systems are legion and legendary. It

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is therefore not surprising to see them push Hermes as a substitute for person-to-person or even telephone-to-telephone conversation, or to push Planet or Delphi as a substitute for face-to-face conferences.

Delphi in particular has an impressive weight of authority behind it, but to work it must be tightly controlled: so tightly controlled in fact as to be extremely manipulable.

On the other hand, the absence of such control can lead to the following sort of teleconference experience. A teleconference was established to coordinate a number of people whose offices were in the same or adjoining buildings. A simple misunderstanding arose concerning the vocal distribution of information which was not then entered into the conference. The result was an edict that no information could be considered valid if it did not appear in the teleconference. This did not quite require an insertion of Peano's axioms so that we could discuss arithmetic, but nearly so. What *did* develop was the Interactive Pie-Throwing Conference, a juvenile exercise in vituperation and graffitic one-upmanship.

The second point, of course, is the astonishing number and variety of ways in which machines in general, and computer-controlled machines in particular, already come between two people engaged in transactions which in simpler times would have been person-to-person. Vending and change machines are obvious examples. Another is the telephone, which was bad enough when it merely stood between two people, but which now may hide another machine - a tape recorder or a speech synthesizer - at the other end. One can turn to the computer for "companionship" in the form of participation in such human games as chess, bridge and poker. Even procreation is not immune to the intervention of the machine.

And so we finally come to the question of the specific role of the microcomputer: How is this little device going to exploit the present tendency towards isolation to bring about the demise of Western civilization? In brief, by bringing total isolation within the reach of anyone who wants it.

We are surrounded by ample evidence of how this will come about. Essentially any profession - except the world's oldest - could be followed in complete isolation. It is already common to do all of one's shopping by telephone and mail; the microcomputer will make it possible to extend that to the remote ordering - and even fitting - of *tailor-made* clothes.

Computers are already assisting in medical diagnoses. It will not be long before microcomputers will be able to monitor all one's vital signs 100% of the time with 99% accuracy, not to mention the automatic specimen analyzer that will be built into the toilet of the future.

And speaking of analysis, it will no longer be necessary to leave one's womb, even for psychoanalysis.

It is not necessary to elaborate. The microcomputer will enable one to live his entire life without face-to-face contact with another human being.

But just because complete isolation is possible, why would anyone - or more particularly, everyone - want it? Because it is there, for starters. Because someone else has it. Because the machine is efficient as a way of delivering individualized services.

But most important, because it is safe. To meet people face to face is to risk involvement, and involvement is certain to result in pain. Most people will willingly eschew the possible joys of direct contact in order to escape the certain pain. And as face-to-face meetings become more rare, people will forget how to conduct them, the pain will become sharper and more certain and the withdrawals more prolonged.

As might be expected, the computer folk will lead the way. The home terminal is the first step of the great shift away from

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the office and into the home. As computer-powered toys become ever more seductive there will be ever less reason for unfiltered interpersonal communication.

Writing in the *San Francisco Chronicle,* Charles McCabe has characterized the influence of television as a "new loneliness [which] is an inhuman condition, a deliberate removal of self from the concerns which have always moved human beings. Worse, it is an abdication of self."

This abdication of self is a technologically induced change that Western civilization cannot withstand. The result may be chaos or another civilization (I think the latter). It may be better or worse than Western civilization (right now, I'd put my money on worse), but it will not be Western civilization.

David F. Stevens

David F. Stevens is a staff senior computer scientist at Lawrence Berkeley Laboratory, Berkeley, California.

He has published widely in the trade press; this is his second article in Computerworld, *an effort supported by a contract with the U.S. Department of Energy.*

Stevens holds a B.A. degree from the California Institute of Technology and an M.A. from the University of California, both in mathematics.

PERSONNEL CHANGES

New members of UTCS' staff this month are: Janet Gebhardt working as Operator in the Engineering Annex and Rosa Stramaglia, the new Accounting Clerk.

John Chapman, after 12 years with UTCS, has left for a new position at National Trust. Kathleen Sloan of Text Services and Ron Benn of CSS have also left.

Best of luck to all in their new jobs.

Kathryn Bourne

NEW TITLES IN THE DCS LIBRARY

DeMarco, Tom.
Structured analysis and system specification.
Englewood Cliffs, N.J., Prentice-Hall, 1979.

International FCT-Conference, lst, Poznan-Kornik, Poland, 1977.
Fundamentals of computation theory, ed. by M. Karpinski.
Berlin, Springer-Verlag, 1977.

Jensen, Kathleen and Wirth, N.
PASCAL user manual and report. 2d ed.
New York, Springer-Verlag, 1974.

Lavington, Simon Hugh.
Early British computers.
Bedford, Mass., Digital Press, 1980.

SAS Institute. Staff.
SAS user's guide, 1979 edition, ed. by Jane T. Helwig and Kathryn A. Council.
Cary, N.C. SAS Institute, 1979.

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EA = Engineering Annex
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